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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/777,774

02/06/2001

James E. DeGrange JR.

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05/10/2004

BIRCH STEWART KOLASCH & BIRCH
PO BOX 747
FALLS CHURCH, VA 22040-0747

EXAMINER

PAYNE, DAVID C

ART UNIT

PAPER NUMBER

2633

DATE MAILED: 05/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application

09/777,774

Applicant(s)

DEGRANGE ET AL.

Examiner

David C. Payne

Art Unit

2633

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 February 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7, 9-20 and 22-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7, 9-20 and 22-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

Response to Arguments

1. Applicant's arguments with respect to claims 1-7, 9-20 and 22-25 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claim(s) 1-4, 6, 7, 9-19, and 22-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Terahara US006535309B1 (Terahara) in view of Barnard et al. US 6,219,162 B1 (Barnard).

Re claims 1, 7, 16

Terahara disclosed

An optical communications apparatus/method (Figure 1) for power balancing a wavelength division multiplexed (WDM) signal output from an add module (10) adding at least one channel to a signal input thereto, comprising: a gain element (26) optically coupled to the add module and to an add channel port receiving at least channel to be added; said gain element imparting optical gain to the at least one channel received from the add channel port; a controller (25) operatively coupled to said gain element, said controller receiving an added/dropped power measurement of the signal input/output to/from the add/drop module; said controller determining an add path amplification value based on the input power measurement (e.g., col./line: 7/28-45), a through loss associated with a signal passing through the add module (Lt), and an add loss associated with a signal traveling an add path of the add module (Ld) (see, col./line: 8/35-47); and said controller controlling said gain element according to the add path amplification value.

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72 Terahara does not disclose where said gain element having a gain profile substantially matching a gain profile of the signal input to the add/drop module. Barnard disclosed the problems with an optical transmission experiencing a different gain profile along a transmission path (col./line: 1/40-50) and solution of performing a matching equalization process for transmission (col./line: 11/5-15). It would have been obvious to one of ordinary skill in the art at the time of invention to perform gain matching so as to eliminate optical signal impairments along the transmission line.

Re claim 6,

Terahara disclosed an optical communications apparatus for power balancing a wavelength division multiplexed (WDM) signal further comprising: a coupler (21) optically coupled to a drop output of the add/drop module, an optical-to-electrical converter optically coupled to said coupler, said optical to-electrical (photoelectric conversion, see col./line: 7/30-35) coupler receiving a portion of light from the at least one dropped channel; said controller determining the dropped channel power measurement from an output of said optical-to-electrical converter.

Re claims 9, 10, 11, 13, 22, 23

an input/drop amplifier optically coupled an input port of the add module and receiving a plurality of input channels (see Figure 5).

Re claims 2, 3, 4, 17, 18 and 19

Terahara does not disclose determining the add path amplification value based on the number of channels to be added or dropped or both. However it would have been obvious to one of ordinary skill in the art at the time of invention that the amplification value would be based on the change in the number of channels since Terahara disclosed adding or dropping more than one channel and his invention is designed to regulate power (e.g., col./line: 7/25-40) therefore regulation would necessarily account for the entire number of added or dropped channels.

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Re claims 12, 25

Terahara does not disclose output amplifier performing gain flattening amplification for the signal output from the add module. However it would have been obvious to one of ordinary skill in the art at the time of invention that the regulation function of the controller disclosed in Terahara flattens the gain amplification of the added signal for the benefit of "regulating" or producing a composite signal at the output where the wavelengths have equivalent signal output that does not interfere with the other signal reception at the receiver.

Re claims 14, 15, 24

Terahara does not disclose wherein said gain element includes an add amplifier and a variable optical attenuator, said controller controlling said variable optical attenuator/amplifier according to the add path amplification value. However, Terahara does disclose either an amplifier or VOA as an embodiment of the power regulation element (26, see col./line: 7/30-40). It would have been obvious to one of ordinary skill in the art at the time of invention that both of these elements could be used at once in the Terahara invention for the benefit of amplifying or attenuating individual add signals as needed. Where some signals may require attenuation rather than amplifying all signals and possibly causing problems in downstream receivers.

4. Claim(s) 5 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Terahara US006535309B1 (Terahara) and Barnard US 6,219,162 B1 (Barnard) as applied to claims 1 and 16 above, and in further view of Xiao et al. US 20020101636A1 (Xiao).

Re claims 5 and 20

The modified invention of Terahara and Barnard does not disclose controlling the amplification equation exactly as disclosed, namely

$$P_{\text{sub.addtotal}} = P_{\text{sub.in}} + (\text{Add Loss} - \text{Through Loss}) + 10 \log N_{\text{sub.add}}$$
 where $P_{\text{sub.addtotal}}$ = add path amplified power level in dBm, $P_{\text{sub.in}}$ = per channel power level of signal input to the add module in dBm, Through

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Loss=loss associated with a signal passing through the add module in dBm, Add Loss=loss associated with a signal travelling an add path of the add module in dBm, and N.sub.add=number of added channels.

However, Xiao disclosed controlling a variable attenuation of add channels based on the following equations $P_{add,out} = P_{add} - L = 10 \log (y\%) - L$, where $P_{add,out}$ is the power of the added channel, L is the loss introduced the VOA and y is the power taken by the tap (eg. P.4, (eq. 3). Further equations in Xiao taken into account power loss of through signals expressed a $P_{express}$ (eq. 2, p.3). While Xiao does not use the same mathematical expression as the applicant it would have been obvious to one of ordinary skill in the art at the time to calculate amplification of power in the Terahara/Barnard invention similar to the Xiao invention to completely account for losses in all elements of the add/drop element.

Conclusion

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to David C. Payne whose telephone number is (703) 306-0004. The examiner can normally be reached on M-F, 7a-4p.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (703) 305-4729. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Dcp


JASON CHAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600